

REMARKS

Favorable reconsideration and withdrawal of the objections and rejection set forth in the above-mentioned Official Action in view of the foregoing amendments and the following remarks are respectfully requested.

Specification

The specification has been amended to improve its form. It is respectfully submitted that no new matter has been added.

Claims Status

Claims 19 through 46 are now pending in the application. Claims 1 through 18 have been canceled. Claims 19 through 46 have been added to even more succinctly claim the disclosed invention. It is respectfully submitted that no new matter has been added. Claims 19, 27, and 36 are the only independent claims pending in the application.

Claim Objections

Claim 1 is objected to for the reasons set forth in the Official Action.

Response to Claim Objections

Without conceding the propriety of the objections and to expedite the prosecution of the application, Claim 1 *inter alia* also has been canceled. In addition, the claims now on file avoid the recitations underlying the rejection. Accordingly, the objections are now moot.

Section 102 Rejection

Claims 1 through 18 are rejected under 35 U.S.C. § 102(e) as being anticipated by U.S. Patent No. 6,654,570 (Kato).

Response to Art Rejections

Again, without conceding the propriety of the rejection and to expedite the prosecution of the application, Claims 1 through 18 have been canceled in lieu of Claims 19 through 46. Accordingly, the art rejection also is moot and further comment thereon is not necessary.

Comments

The following comments are provided for the Examiner's consideration of the newly-presented claims.

Independent Claim 19

In switching a voltage for image transfer, a voltage of a transfer member is set to a desired transfer voltage value by switching of an output of a voltage application means before the toner image transfer is actually performed. This is done because there is a time lag before the voltage being applied converges to a desired transfer value. When image transfer is performed during the time lag, a desired transfer value may not be obtained. Accordingly, an image transfer failure may result. It has been found that the time lag occurs because the transfer member has a constant electricity capacity, and the time lag becomes longer as a switching voltage difference becomes larger.

In view of the above, independent Claim 19 calls for an image forming apparatus, which calls for:

"[wherein] a difference in the first mode between the first voltage value and the second voltage value is larger than a difference in the second mode between the first voltage value and the second voltage value; and

[wherein] a time period of the first mode from timing of a switching operation controlled by the control means to timing that a position of the image carrier corresponding to a tip position of the printing member has reached the transfer position is longer than a time period of the second mode from the timing of switching operation controlled by the control means to a timing that a position of the image carrier corresponding to the tip position of the printing member has reached the transfer position."

In the apparatus of Claim 19, switching is controlled by a control means, wherein when a position corresponding to a position of the end of the printing member approaches a transfer position, a voltage value of the transfer member becomes close to the second voltage value; that is, when the toner image is transferred, a voltage value becomes close to the voltage for transfer to a similar extent in either of the first mode and the second mode. Thus, it is possible to ensure that transferability can be provided as well at the position corresponding to the end of the transfer member regardless of the selection of the modes.

Kato discloses an image forming apparatus, which features operating modes having three stages of transfer bias and two stages of transfer bias. In both modes, a transfer bias is switched to a second stage bias at a similar timing. In the mode having three stages of transfer bias, after switching to the second stage bias is performed, switching to a third stage transfer bias is performed. Selection of these modes is performed according to a rise and fall of the transfer voltage. When a transfer voltage is high, the mode having three stages of transfer bias is selected.

Assuming that the transfer voltage is defined as a second voltage value and a mode in which the second voltage value is high is considered to be a first mode, when the second voltage value is high, the mode having three stages of transfer bias is considered to be the

first mode. Then, switching to the second voltage value performed by control means in the first mode, i.e., switching from the second stage transfer bias to the third stage transfer bias is performed after switching to the second voltage value in the second mode, i.e., switching from the first stage transfer bias to the second stage transfer bias. Therefore, Kato discloses a voltage relationship, which is opposite from the voltage relationship recited in Claim 19.

Independent Claim 27

If a transfer member reaches a transfer voltage after a considerable time has elapsed since a printing member has approached a transfer position, a transfer failure is caused because of an insufficiency of transfer current at the end of the printing member.

Independent Claim 27 features a mode, which calls for a transfer means for controlling switching of an output from voltage application means before the approach of the printing member is provided as means for preventing an insufficiency of the transfer current.

A voltage of a transfer member may reach a desired value and a transfer current may flow to an image carrier without passing through a printing member, and an electric memory may be generated at the image carrier immediately after switching of an output from the voltage application means is controlled. This is because its electric resistance and an electric capacity may be varied according to the temperature of the transfer member.

In view of the above, the invention of Claim 27 currently amended is characterized in that:

“[wherein] the first mode is a mode such that the control means controls the voltage application means so as to switch the output before a printing member is transported to a transfer position between the image carrier and the transfer member, and

[wherein] the second mode is a mode such that the control means controls the voltage application means so as to switch the output of the voltage application means when the printing member is transported to the transfer position between the image carrier and the transfer member.”

Kato discloses a mode, wherein switching of a transfer voltage is performed before “the printing member” approaches “the transfer position”. However, Kato does not disclose or suggest a mode in which switching is performed by a control means when the printing member is performed by the control means when the printing member approaches the transfer position.

Independent Claim 36

Claim 36 calls for an image forming apparatus, wherein when a mode having a large switching voltage difference is used, a voltage switching control is immediately performed. Claim 36 is characterized in that switching is performed by the control means in the first mode in which a long time lag tends to be generated earlier than in the second mode. This produces an advantageous result in that when a toner image is transferred, a voltage value is close to the voltage for transfer to a similar extent in the first mode and the second mode and a transfer property is achieved at the position corresponding to the end of the transfer member regardless of the selection of the modes.

It is respectfully submitted that independent Claims 19, 27, and 36 recite features which are neither disclosed or suggested by Kato.

Dependent Claims

Claims 20 through 26, 28 through 35, and 37 through 46 depend either directly or indirectly from one of Claims 19, 27, and 36 and are allowable by virtue of their dependency and in their own right for further defining Applicants' invention. Individual consideration of the dependent claims is respectfully requested.

Closing

It is respectfully submitted that the claims on file are allowable over the art of record and that the application is in condition for allowance. Favorable reconsideration and early passage to issue of the application are earnestly solicited.

Applicants' undersigned attorney may be reached in our Washington, D.C. office by telephone at (202) 530-1010. All correspondence should continue to be directed to our New York office at the address shown below.

Respectfully submitted,



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